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EXAMINER	
YU, LIHONG	
ART UNIT	PAPER NUMBER
2611	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,552	RIES, LIONEL	
	Examiner	Art Unit	
	LIHONG YU	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,8,9 and 12-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,8,9 and 12-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's amendment to the claims, received on March 29, 2010, with respect to claim objections have been fully considered and are persuasive. The objections of claims 1-8 and 15 have been withdrawn.

2. Applicant's amendment to the claims, received on March 29, 2010, with respect to claim rejections under 35 USC 112, second paragraph, have been fully considered and are persuasive. The rejection of claim 4 under 35 USC 112, second paragraph, has been withdrawn.

3. Applicant's arguments with respect to claim rejections under 35 USC 102 and 103 have been fully considered but they are not persuasive.

Applicant's Arguments: "Applicant respectfully submits that Schilling '824 does not teach that the despreading processing is performed by code tracking with the aid of a delay-lock loop (DLL) and the carrier processing is performed with the aid of a frequency-lock loop (FLL).Applicant has amended claim 1 by introducing the features of claim 6 and 7 to address this rejection. As Schilling '824 does not teach each and every element of claim 1 as amended, reconsideration of the present rejection is respectfully requested".

Examiner's Response: The Applicant has amended the rejected independent claims 1 and 9 to include the rejected dependent claims. The Applicant contends that the newly added limitations, "code tracking processing is performed with the aid of a delay-lock loop (DLL) and the carrier tracking processing is performed with the aid of a frequency-lock loop (FLL)", are not disclosed in Schilling. Schilling discloses a despreadinq method using code tracking and carrier tracking (see Schilling at Fig. 2 and col. 8, lines 8-26). Although Schilling does not disclose a specific dispreading method, Thomas teaches such a dispreading method in an analogous art (see Thomas at col. 18, lines 1-9 and col. 23, lines 33-48 for FLL, and col. 18, lines 10-22 and col. 23, lines 33-48 for DLL). The combination of Schilling and Thomas would address each limitation of the current amended independent claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3, 5, 8, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US 6,396,824 B1) in view of Thomas et al (US 6,711,219 B2).

Consider claims 1 and 9:

Schilling discloses a method for the demodulation of radio navigation signals (s(t)) transmitted in spread spectrum (*see Schilling at col. 2, lines 10-24, where Schilling describes a method that can be used in a spread-spectrum CDMA communication system for geo-locating a*

remote unit) and comprising a data channel which is modulated by a navigation message (*see Schilling at col. 2, lines 10-24, where Schilling describes a modulated message data signal*) and a pilot channel which is not modulated by a navigation message (*see Schilling at col. 2, lines 10-24, where Schilling describes using a separate spread-spectrum channel as a pilot signal; see col. 2, lines 50-55, where Schilling describes the pilot channel is not modulated by the message data*), the data channel and the pilot channel being combined into one multiplexing scheme in order to modulate a carrier (*see Schilling at col. 3, lines 26-46, where Schilling describe combining the base-generic-chip-code signal, i.e. the pilot signal, with the spread-spectrum processed message data to generate a CDMA signal to be transmitted; see col. 7, lines 45-50, where Schilling describes the carrier frequency is* f_0), this method comprising:

- subjecting the signals of the pilot and data channels to de-spreading processing (*see Schilling at Fig. 2, col. 7, lines 51-67 and col. 8, lines 1-37, where Schilling describes that generic mixer 123 uses the replica of the generic-chip-code signal for dispreading the CDMA signal; the message mixer 124 uses the replica of the message-chip-code signal for dispreading the CDMA signal*) and in
- demodulating the despreaded data signal (r_d) in order to obtain the navigation message (d(t)) (*see Schilling at Fig. 2 and col. 8, lines 38-45, where Schilling describes the detector 139 demodulates the modulated data signal to get the message data*),
- wherein the demodulation of the despreaded data signal (r_d) used to obtain the navigation message (d(t)) is performed with the aid of the carrier (r_p) obtained from the despreading processing of the pilot channel (*see Schilling at Fig. 2, col. 7, lines*

60-67 and col. 8, lines 1-7, where Schilling describes that the dispreading using the generic-chip-code signal produces the recovered carrier signal; see col. 7, lines 5-12, where Schilling describes that the detector 139 uses the recovered carrier signal)

and

- wherein the despreadinq processing is performed by code tracking processing, combined with carrier phase or frequency tracking processing (*see Schilling at Fig. 2 and col. 8, lines 8-26, where Schilling teaches a Acquisition and Tracking circuit 131 that acquires and tracks the carrier signal and provides input to the message-chip-code generator 122 that is used in dispreading; Schilling describes the message-chip-code generator 122 generates a replica of the message-chip-code signal based on the synchronization information from the Acquisition and Tracking circuit 131, thus carrier tracking processing*).

However, Schilling does not specifically disclose the above carrier tracking processing is performed with the aid of a frequency-lock loop (FLL) and the code tracking processing is performed with the aid of a delay-lock loop (DLL).

Thomas teaches a carrier tracking processing is performed with the aid of a frequency-lock loop (FLL) (*see Thomas at col. 18, lines 1-9 and col. 23, lines 33-48, where Thomas teaches using a Frequency Lock Loop (FLL) to track carrier frequency*) and a code tracking processing is performed with the aid of a delay-lock loop (DLL) (*see Thomas at col. 18, lines 10-22 and col. 23, lines 33-48, where Thomas teaches using Delay Lock Loop (DLL) for code tracking*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have FLL and DLL, as taught by Thomas, thus allowing for simultaneous cross-channel and co-channel interference mitigation, as discussed by Thomas (*see Thomas at col. 23, lines 24-29*).

Consider claim 3:

Schilling in view of Thomas discloses the method as claimed in claim 1 above. Schilling discloses that the pilot channel and the data channel of the signal to be demodulated are phase-multiplexed (*see Schilling at col. 4, lines 62-67, where Schilling teaches that the received signals are phase modulated*).

Consider claim 5:

Schilling in view of Thomas discloses the method as claimed in claim 1 above. Schilling discloses that the pilot channel and the data channel of the signal to be demodulated are multiplexed in accordance with a scheme in which the carrier contains at least the data channel and the pilot channel of the signal to be demodulated (*see Schilling at Fig. 2 and col. 7, lines 39-50, where Schilling teaches a modulator 107 that modulates the combined generic-chip-code signal, that is the pilot channel, and spread-spectrum-processed signal, that is the data channel, by a carrier signal at a carrier frequency* f_0).

Consider claim 8:

Schilling in view of Thomas discloses the method as claimed in claim 1 above. Schilling discloses that it is applied to the demodulation of satellite navigation signals of the GPS-IIF L5, L2C type, or to the demodulation of satellite navigation signals transmitted by the GALILEO

system, or transmitted by ground stations, by modernized GLONASS satellites or by COMPASS or QZS satellites (*see Schilling at the abstract, where Schilling describes a base station for transmitting message data in a system for locating remote units*).

Consider claim 16:

Schilling in view of Thomas discloses the receiver as claimed in claim 9 above. Schilling does not specifically disclose that the frequency-lock loop (FLL) is designed to receive Doppler velocity aid from a navigation system.

Thomas teaches a frequency-lock loop (FLL) is designed to receive Doppler velocity aid from a navigation system (*see Thomas at Fig. 7 and col. 16, lines 38-63, where Thomas describes acquisition of Doppler offset for the frequency-lock loop, Thomas describes that the Doppler offset is a result of the relative velocity between the transmitter and a receiver*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have that the frequency-lock loop (FLL) is designed to receive Doppler velocity aid from a navigation system, as taught by Thomas, thus allowing for simultaneous cross-channel and co-channel interference mitigation, as discussed by Thomas (*see Thomas at col. 23, lines 24-29*).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US 6,396,824 B1) in view of Thomas et al (US 6,711,219 B2), as applied to claim 1 above, and further in view of Clapp (US 5,943,248).

Consider claim 2:

Schilling in view of Thomas discloses the method as claimed in claim 1 above. Schilling discloses the combiner may be a nonlinear combiner (*see Schilling at col. 14, lines 25-31*). Schilling does not specifically disclose the nonlinear signal combination is time multiplexed. Clapp teaches time-multiplexing is a nonlinear signal combination (*see Clapp at col. 2, lines 60-67 and col. 3, lines 1-2, where Clapp describes the combination of a first and a second input values with a non-linear combiner that is a time multiplexed combiner*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have time multiplexed data channel and pilot channel, as taught by Clapp, thus allowing for hardware efficient signal combination, as discussed by Clapp (*see Clapp at col. 1, lines 65-67 and col. 2, lines 1-7*).

7. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US 6,396,824 B1) in view of Thomas et al (US 6,711,219 B2), as applied to claim 9 above, and further in view of Lloyd et al (US 7,183,971 B1).

Consider claim 12:

Schilling in view of Thomas discloses the receiver as claimed in claim 9 above. Schilling does not disclose that the frequency-lock loop (FLL) comprises a discriminator of extended arctangent form.

Lloyd teaches a frequency-lock loop (FLL) comprises a discriminator of extended arctangent form (*see Lloyd at Fig. 4 and col. 10, lines 6-43, where Lloyd describes a FLL with an arctangent frequency discriminator 412*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have FLL with a discriminator of extended arctangent form, as taught by Lloyd, thus allowing for a broad range of selection of the loop update rate, as discussed by Lloyd (*see Lloyd at col. 10, lines 26-43*).

Consider claim 13:

Schilling in view of Thomas discloses the receiver as claimed in claim 9 above. Schilling does not disclose that the frequency-lock loop (FLL) comprises a first-order or second-order loop filter which is adapted to the dynamics of the received signals.

Lloyd teaches a frequency-lock loop (FLL) comprises a first-order or second-order loop filter which is adapted to the dynamics of the received signals (*see Lloyd at Fig. 4 and col. 10, lines 55-67, where Lloyd describes a first-order FLL loop filter 414*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have a first-order or second-order loop filter, as taught by Lloyd, thus allowing for a broad range of selection of the loop update rate, as discussed by Lloyd (*see Lloyd at col. 10, lines 26-43*).

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US 6,396,824 B1) in view of Thomas et al (US 6,711,219 B2), as applied to claim 9 above, and further in view of David (US 6,538,599 B1).

Consider claim 14:

Schilling in view of Thomas discloses the receiver as claimed in claim 9 above. Schilling does not disclose (1), the output of the filter of the frequency-lock loop (FLL) is coupled to the delay-lock loop (DLL), and (2), the delay-lock loop comprising a zero-order loop filter.

Regarding item (1), Thomas discloses the output of the filter of a frequency-lock loop (FLL) is coupled to the delay-lock loop (DLL) (*see Thomas at Fig. 7, col. 22, lines 64-67 and col. 23, lines 1-23, where Thomas shows the output of a FLL is connected to the input of a DLL*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have that the output of the filter of the frequency-lock loop (FLL) is coupled to the delay-lock loop (DLL), as taught by Thomas, thus allowing for simultaneous cross-channel and co-channel interference mitigation, as discussed by Thomas (*see Thomas at col. 23, lines 24-29*).

Regarding item (2), David teaches using a zero-order filter (*see David at col. 4, lines 15-37, where David describes a zero-order filter is utilized in a circuit*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have a zero-order filter, as taught by David, thus allowing for achieving further processing gains, as discussed by David (*see David at col. 4, lines 15-37*).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US 6,396,824 B1) in view of Thomas et al (US 6,711,219 B2), as applied to claim 9 above, and further in view of Kowalski (US 6,470,044 B1).

Consider claim 15:

Schilling in view of Thomas discloses the receiver as claimed in claim 9 above. Schilling does not disclose that the delay-lock loop (DLL) comprises a discriminator which is applied to the pilot signals and to the data signals, the data signals being weighted by a coefficient which depends on the signal-to-noise spectral density ratio (C/N_0) of the received signals.

Kowalski teaches a delay-lock loop (DLL) that comprises a discriminator which is applied to a pilot signals and to a data signals (*see Kowalski at Fig. 2 and col. 10, lines 1-15, where Kowalski describes a DLL that has a first input connected to a finger receiver and a second input to receive a pilot signal*), the data signals being weighted by a coefficient which depends on the signal-to-noise spectral density ratio (C/N_0) of the received signals (*see Kowalski at Fig. 3 and col. 11, lines 5-11, where Kowalski describes that the receiver selectively weights the received signal to emphasize the signal to noise ratio*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Schilling, and to have that the delay-lock loop (DLL) comprises a discriminator which is applied to the pilot signals and to the data signals, the data signals being weighted by a coefficient which depends on the signal-to-noise spectral density ratio (C/N_0) of the received signals, as taught by Kowalski, thus allowing for maximizing the signal to noise

ratio in the presence of colored noise, as discussed by Kowalski (*see Kowalski at col. 8, lines 48-58*).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIHONG YU whose telephone number is (571) 270-5147. The examiner can normally be reached on 8:30 am-7:00 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lihong Yu/
Examiner, Art Unit 2611
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